Problem Sheet 6

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In this problem sheet, you are required to develop classes to describe the students at a university.

Q. 1 Write a class students at the university that has the following public members:

- a string for the student's name;
- a double precision floating point variable that stores the library fines owed by the student;
- a double precision floating point variable that stores the tuition fees owed by the student;
- a method that returns the total money owed by the student,that is, the sum of the library fines and tuition fees associated with a given student;
- a few constructors that take different arguments.

Q. 2 The library fines owed by the students must be a nonnegative number. Enforce this by making a student's library fines a private member of the class. Write one method that allows the user to set this variable only to nonnegative values, and another method that can be used to access this private variable. Both methods should be public members of the class.

Q. 3 Students at the university are either graduate students or undergraduate students. All undergraduate students are full-time students. Graduate students may be full- time students or part-time students. Derive a class of graduate students from the class of students that you have already written with an additional member variable that stores whether the student is full-time or part-time.

Q. 4 Ph.D. students are a special class of graduate students who do not pay library fines. Derive a class of Ph.D. students from the class of graduate students. Write a method that calculates the total money owed by a Ph.D. student.

Remark 0.1. .

- Write the UML class relation for Question 4.
- Write a single main function to show the usage of the above designed classes.
- Each class should be declared in a header file with ".hpp" extension, of its own.
- Each class should be defined in a source file with ".cpp" extension, of its own.
- Finally a single "makefile" should be written to compile all the codes and create an executable.